9. Upgrade and Thermomonitoring as of 01.96

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9.1 Scope of Update

Which functions and assemblies are affected?

Please note for US versions in the USA and Canada: ThemoMonitoring is only available for the Incubator 8000 IC, not for the Incubator 8000 SC and NC.

1. Optional second skin-temperature measurement channel for ThermoMonitoring:
   With ThermoMonitoring the skin temperature is measured on the torso using one skin-temperature sensor, with a second being employed to establish the temperature of the extremities. The temperature difference enables conclusions to be drawn about the patient's condition. The second channel can be read out either via an additional key or by way of the familiar optional RS232 interface (BabyLink). Important: Skin-temperature regulation is only performed via the first channel.

2. Extended temperature measurement and display range for skin-temperature measurement:

   old: 33.0 to 38.0 °C
   new: 30.0 to 42.0 °C

3. All US versions for the USA and Canada with ThermoMonitoring will be delivered with a skin temperature alarm limit of 1.0 ºC according the US version of the Operating Instructions of the Incubator 8000 IC Software Version 21.n.

4. New connection location for skin-temperature measurement/different skin-temperature sensor:

   The skin-temperature sensors (1 or 2) are connected to the basic housing on the left-hand side. Use can only be made of the familiar disposable sensors 2M 20 737 as a different connector is employed. The adapter 2M 20 736 which used to be required for these disposable sensors is no longer needed.

5. Incubator 8000 IC, new climate sensor: The new climate sensor does not have any connections for skin-temperature sensors.

6. Modified panel with brief operating instructions, central alarm LED with SC/NC:

Inc. 8000 IC:	Different labeling, only for SW 21.nn
Inc. 8000 SC:	With immediate effect, brief operating instructions as new feature, as of SW 11.nn with option of alarm LED (central alarm).

   The new instruction panel has no hole for the mains switch to prevent inadvertent switch-off of the unit in an alarm situation with the panel closed. The panel features the key symbol for "Horn off" and is designed such that the acoustic alarm can be

suppressed by pressing the panel. There is no longer any printing on the panel; it is provided with language-specific stickers.

7. New software 11.nn (SC/NC) or 21.nn (IC):

Required for:
- Extended skin-temperature measuring range
- Interrogation of additional key with ThermoMonitoring (2 channels)
- The Incubator 8000 IC additionally features the function "Auto-humidity", where the incubator automatically sets the humidity set point as a function of air temperature set point.
- There are new operating instructions for the new software versions
- Central alarm LED with SC/NC
- Alarms for skin-temperature sensors can be acknowledged
- O2 sensor alarm due to differences between the two O2 sensors can be acknowledged. Such an alarm may occur if, for example, the front flap is opened and the two O2 sensors are exposed to differing inflows.

8. New Analog PCB:

This additional PCB has 2 skin-temperature channels and an extended skin-temperature measuring range of 30 to 42 °C. It is not compatible with the previous Analog PCBs.

9. New incubator hoods:

The Incubators 8000 SC/IC/NC can be optionally equipped with removable double walls:

Inc. 8000 SC:	left, back and right double wall
Inc. 8000 NC:	left, back and right double wall
Inc. 8000 IC:	back and right double wall only; the left double wall beneath the climate sensor is indispensable for proper functioning.

The following conversion kits are available for the old incubator models with double-wall canopies:

Inc. 8000	2M 21 590
Inc. 8000 IC	2M 21 590
Inc. 8000 SC	2M 21 605

Exception: Incubators of the 8000 series produced in 1987 cannot be converted.

9.2 Recognition of "New" Incubators

The new units can be identified from the following features:

- New software versions

  - o Incubator 8000 SC / NC = 11.nn (old = 10.nn)
  - o Incubator 8000 IC = 21.nn (old = 20.nn)
  - o New operating instructions

  Note: The software version can be read out in service mode.

- Connections for skin-temperature sensor(s) on left side of basic housing

- Differences in terms of function:

  For the Incubators 8000 SC / NC without skin-temperature measurement the only difference as regards function and operation between SW 10.nn and 11.nn is that the SC / NC with SW 11.nn features an alarm LED (central alarm).

  For the Incubators 8000 SC / NC with skin-temperature measurement a further difference in function between SW 10.nn and 11.nn in addition to the alarm LED is the skin-temperature measuring range. As an option, 2 skin-temperature sensors can be connected to units with SW 11.nn.

  On the Incubator 8000 IC the differences in terms of function between SW 21.nn and SW 20.nn are as follows:

  - o Larger measuring range for skin temperature (if provided)
  - o Option of 2 skin-temperature sensors
  - o Auto-humidity

9.3 New/modified Assemblies

9.3.1 New Software

Incubator 8000 IC new
current as of 1999 = SW 21.02 2M 22 331

Incubator 8000 SC / NC new (not available for US versions)
current as of 1999 = SW 11.02 2M 22 332

Comparison with old software versions 10.nn (SC/NC) and 20.nn (IC):

Incubator 8000 IC with skin-temperature measurement		
Assembly	**SW 21.nn (new)**	**SW 20.nn (old)**
Analog PCB	Order no. 82 90 680 Connection of 1 or 2 skin-temperature sensors is by way of wiring harness on left of basic housing. Recognition of 1 or 2 sensors is via the wiring harness which has its own connector separate from the other sensor connections. Range: 30 to 42 °C	Order no. 82 00 920 Connection of skin-temperature sensor on IC is to climate sensor. Range: 33 to 38 °C.
Climate sensor	2M 21 688, without skin temp. connection	82 90 380, with skin temp. connection
Keypad	New keypad 2M 21 681 with additional key for readout of second skin-temperature channel. If key is not needed due to absence of thermomonitoring option, the key position is covered with a strip.	Use can be made of either the old or the new keypad, see 9.3.4.
Skin display PCB	New skin display PCB 82 90 691 with LED at different position for additional key required for readout of optional second skin-temperature channel.	Use can be made of old or new Display PCB, see 9.3.5.
Operating instructions	new, see 9.3.2 For example due to changes to: - Skin-temperature measurement - "Auto-humidity" function - Hoods	see 9.3.2

Incubator 8000 IC without skin-temperature measurement		
Assembly	**SW 21.nn (new)**	**SW 20.nn (old)**
Climate sensor	2M 21 688 without skin temperature connection	82 90 380 with skin temperature connection
Operating instructions	new, see 9.3.2 For example due to changes to: - "Auto-humidity“ function - Hoods	see 9.3.2

Incubator 8000 SC/NC with skin-temperature measurement		
Assembly	**SW 11.nn (new)**	**SW 10.nn (old)**
Analog PCB	Order no. 82 90 680 Connection of 1 or 2 skin-temperature sensors is by way of wiring harness on left of basic housing. Recognition of 1 or 2 sensors is via the wiring harness.	Order no. 82 00 920 Skin-temperature sensor is connected on back of unit. Range: 33 to 38 °C.
Keypad	New keypad 2M 21 691 with additional key for readout of second skin-temperature channel. If key is not needed due to absence of thermomonitoring option, key position is covered with a strip. Additional feature: Alarm LED (central alarm).	Use can be made of either the old (without Alarm LED) or the new keypad (with Alarm LED). Note: The central alarm LED is not served by SW 10.nn and is also not described in operating instructions.
Skin display PCB	New skin display PCB 82 90 691 with LED at different position for additional key needed for readout of optional second skin-temperature channel.	Use can be made of old or new Display PCB.
Operating instructions	new, see 9.3.2 For example due to changes to: - Skin-temperature measurement - Hoods - Central alarm LED - Brief operating instructions on SC	see 9.3.2

Incubator 8000 SC/NC without skin-temperature measurement		
No fundamental changes in terms of function between SW 10.nn and 11.nn, however different operating instructions.		
Assembly	**SW 11.nn (new)**	**SW 10.nn (old)**
Keypad	with central alarm	without central alarm
Operating instructions	new, see 9.3.2 For example due to following changes: - Hoods - Central alarm LED - Brief operating instructions on SC	see 9.3.2

Important: The software versions 11.nn and 21.nn only function in conjunction with the following CPU PCBs:

- CPU Standard 2 PCB 83 05 141

- CPU Incubator PCB 82 90 571 ≥ 01

  Note: The PCB CPU Incubator 82 90 571 with the modification status "00" is being replaced by a modification status "≥ 01", see IDM no. 15 or TSB no. 12.

9.3.2 Operating instructions

There are new operating instructions for the new units:

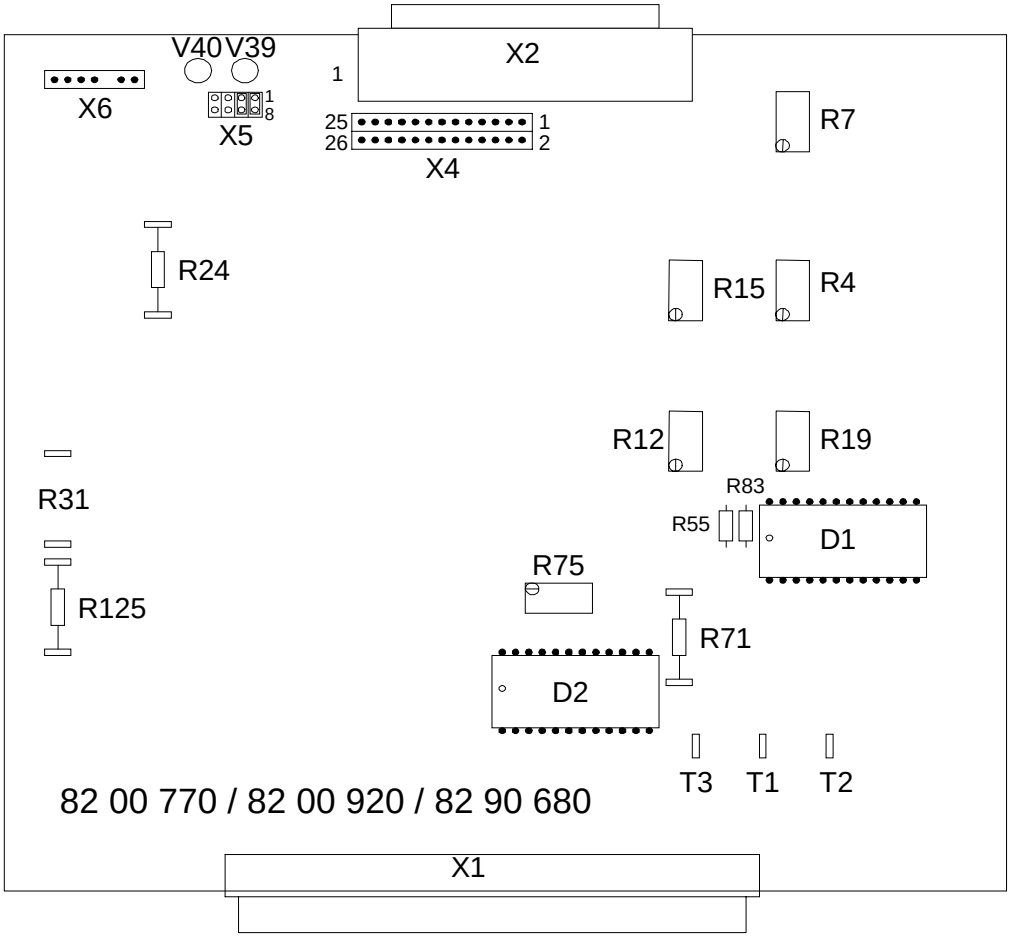
Unit	SW 21.nn (IC) / 11.nn (SC/NC)		SW 20.nn (IC) / 10.nn (SC/NC)	
Incubator 8000 IC Instruction for Use 6141.222	German English French Spanish American Dutch Italian	90 28 264 90 28 260 90 28 487 90 28 488 90 28 489 90 28 490 90 28 491	German English American Dutch Italian	90 27 494 90 27 494 90 28 054 90 28 031 90 28 032
Incubator 8000 SC Instruction for Use 6141.221	German English French Spanish American Dutch Italian	90 28 263 90 28 259 90 28 482 90 28 483 90 28 484 90 28 485 90 28 486	German English French Spanish American Dutch Italian	90 27 493 90 27 493 90 27 526 90 27 526 90 28 055 90 28 029 90 28 030
Incubator 8000 NC Instruction for Use 6141.223	German English French Spanish American Italian	90 28 478 90 28 479 90 28 480 90 28 481 90 28 365 90 28 433	German English French Spanish	90 28 261 90 28 262 90 28 321 90 28 322

9.3.3 Analog PCB

The sensor signals are evaluated with the Analog PCB. This PCB has been revised (new layout without relays) and is available in 3 versions.

Important: The order no. on the PCB describes the function.

Important: Soldering terminals are provided for calibrating the AD converter test voltage:
T1 (AD test) and T2 (+15V) are in parallel with R55
T1 (AD test) and T3 (-15V) are in parallel with R83



Important:

- LED V40 lights if - 5 V for AD converter is available. This voltage is stepped down from the - 15 V.
- LED V39 lights if + 5 V for AD converter is available. This voltage is stepped down from the + 15 V.

9.3.3.1 New Analog PCB 82 90 680 with Skin-temperature Measurement

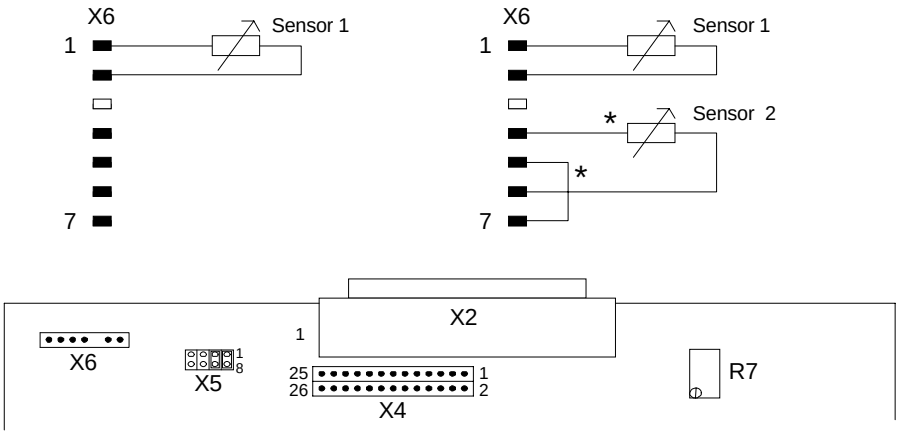
Caution: For use of PCB 82 90 680 up from revision index 03 at least software version 21.02 (IC) or 11.02 (SC/NC) is necessary.

Features:

- One or two skin-temperature channels with range from 30 to 42 °C.
  Encoding for 1 or 2 channels is by way of the skin-temperature connecting cable, which is attached to the connector X6 separate from the other sensor signals.

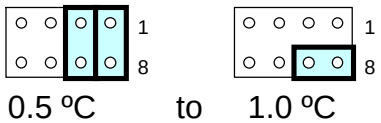
- The Analog PCB 82 90 680 with skin-temperature measurement requires the software versions 11.nn (SC/IC) or 21.nn (IC) on account of the extended measuring range.

- The skin-temperature sensors are not attached via the 25-pin connector of the Analog PCB, but rather separately from the other sensor signals.



Important: All US versions for the USA and Canada with ThermoMonitoring will be delivered with a skin temperature alarm limit of 1.0 ºC according to the US version of the Operating Instructions of the Incubator 8000 IC Software Version 21.n.

For this change the following modification is necessary:
1. Place a sticker " ± 1 ºC " with the order no. 2M 21 921 on the keypad of the skin temperature control module.
2. Change the jumper configuration X5 on the Analog PCB 82 90 680 from:



0.5 ºC to 1.0 ºC

9.3.3.2 Old Analog PCB 82 00 920 with Skin-temperature Measurement

Caution: For use of PCB 82 00 920 up from revision index 16 at least software version 20.04 (IC) or 10.05 (SC/NC) or 1.01 (Inc. 8000 old) is necessary.

Features:

- One skin-temperature channel with range from 33 to 38 °C.

- The Analog PCB 82 00 920 with skin-temperature measurement requires the software versions 10.nn (SC/NC) or 20.nn (IC). This PCB is also used in the Incubator 8000 with SW 0.4 or 1.0. It cannot be employed with the software versions 11.nn and 21.nn on account of the smaller measuring range.

9.3.3.3 Old Analog PCB 82 00 770 without Skin-temperature Measurement

Caution: For use of PCB 82 00 770 up from revision index 15 at least software version 21.02 (IC) or 20.04 (IC old) or 11.02 (SC/NC) or 10.05 (SC/NC old) or 1.01 (Inc. 8000 old) is necessary.

Features:

- No skin-temperature measurement

- The Analog PCB 82 00 770 is used in all incubators of series 8000 without skin-temperature measurement

- All familiar software versions possible (0.4 / 1.0 / 10.nn / 11.nn / 20.nn / 21.nn)

9.3.4 New Keypads

- Keypad Inc. IC without skin temperature 82 90 470

- Keypad Inc. IC with skin temperature 2M 21 681

  with additional key for readout of second skin-temperature channel. The key position is indicated by a strip. This strip must be inserted the other way round in the absence of the thermomonitoring function.

- Keypad Inc. SC/NC without skin temperature 2M 21 182
  with alarm LED (central alarm)

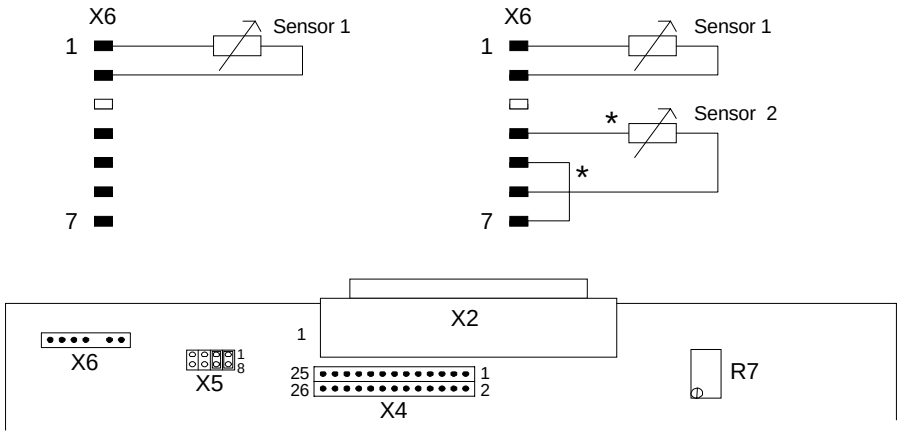
- Keypad Inc. SC/NC with skin temperature 2M 21 691
  with alarm LED (central alarm) and additional key for readout of second skin-temperature channel. The key position is indicated by a strip. The strip must be inserted the other way round in the absence of the ThermoMonitoring function.

9.3.5 New Skin Display PCB

New skin display PCB 82 90 691 is required if a unit is equipped with or prepared for ThermoMonitoring (2 skin-temperature channels). This signifies use of either SW 11.nn or 21.nn together with Analog PCB 82 90 680.

9.3.6 Skin-temperature Wiring Harness

Side connection for skin-temperature sensors with cable link to Analog PCB 82 90 680. Important: With this PCB, skin-temperature sensor(s) is/are attached to connector X6.



1 skin-temperature connection:

- Wiring harness, complete (with socket) 2M 21 738

2 skin-temperature connections (ThermoMonitoring):

- Wiring harness, complete (with 2 sockets) 2M 21 733

9.3.7 New Modules

6 different modules will be available in future as S-part. Note: The scope of delivery does not include the software (EPROM on CPU PCB). Listed here are the 4 current modules of the new sales units; the complete list can be found in Section 4.7. (RAT = Repair/Replacement)

For Incubator 8000 IC, Order no. New part (Order no. RAT):

- Module Inc. 8000 IC without skin temperature (for units with SW 1.0, 20.nn and 21.nn) — 82 90 444 (82 90 606)
- Module Inc. 8000 IC with skin temperature (new) (only for units with SW 21.nn) — 2M 21 680 (2M 21 704)

For Incubator 8000 SC/NC, Order no. New part (Order no. RAT):

- Module Inc. 8000 SC/NC without skin temperature (for units with SW 10.nn and 11.nn) — 2M 21 730 (2M 21 732)
- Module Inc. 8000 SC/NC with skin temperature (new) (only for units with SW 11.nn) — 2M 21 690 (2M 21 698)

Important: Modules with skin temperature and SW 11.nn or 21.nn have a larger skin-temperature measuring range from 30 to 42 °C. This range is made possible by the new Analog PCB 82 90 680. These modules will not function with the old software versions 1.n, 10.nn or 20.nn.

9.4. Spare Parts

This Section lists the spare parts which are either:

1) new,

2) modified,

3) not applicable in future or

4) optional (sometimes in conjunction with certain measures).

All S-parts not listed here remain the same.

9.4.1 Software

Important: When performing repairs, the software version is not to be upgraded from 10.nn to 11.nn or from 20.nn to 21.nn. An exception is the retrofitting of units with the new skin-temperature measurement (ThermoMonitoring).

9.4.1.1 For Incubator 8000 IC

Software version	For units	Prerequisites
20.nn (old)	without skin-temperature meas.	- Analog PCB 82 00 770
20.nn (old)	with skin-temperature meas.	- Analog PCB 82 00 920 - Climate sensor 82 90 380 with skin-temperature connection
21.nn (new)	without skin-temperature meas.	- Analog PCB 82 00 770 - Climate sensor 2M 21 688
21.nn (new)	with skin-temperature meas. (1 or 2 measurement channels)	- Analog PCB 82 90 680 - Skin-temperature connection at basic housing, left - Climate sensor 2M 21 688 - Keypad 2M 21 681

Order numbers:

- Software 20.04 2M 22 327

- Software 21.02 2M 22 331

Important: There are different operating instructions for software 20.nn and 21.nn.

9.4.1.2 For Incubator 8000 SC/NC

Software version	For units	Prerequisites
10.nn (old)	without skin-temperature meas.	- Analog PCB 82 00 770
10.nn (old)	with skin-temperature meas. (1 measurement channel)	- Analog PCB 82 00 920 - Skin-temperature connection on back of unit
11.nn (new)	without skin-temperature meas.	- Analog PCB 82 00 770 - Keypad with alarm LED (central alarm)
11.nn (new)	with skin-temperature meas. (1 or 2 measurement channels)	- Analog PCB 82 90 680 - Skin-temperature connection at basic housing, left - Keypad 2M 21 691

Order numbers:

- Software 10.05 2M 22 326
- Software 11.02 2M 22 332 (not available for US versions)

Important: There are different operating instructions for software 10.nn and 11.nn.

9.4.2 Skin-temperature Connection

See 9.3.6.

9.4.3 Analog PCB

When performing repairs, the same Analog PCB must always be reused.

Analog PCB	**For unit**
82 00 770	For units without skin-temperature measurement, all software versions
82 00 920	For units with skin-temperature measurement and software version 0.4, 1.0, 10.nn or 20.nn
82 90 680	For units with skin-temperature measurement (1 or 2 channels) and software version 11.nn or 21.nn

Caution: For use of this PCB up from revision index 03 at least software version 21.02 (IC) or 20.04 (IC old) or 11.02 (SC/NC) or 10.05 (SC/NC old) or 1.01 (Inc. 8000 old) is necessary.

- Software 10.05 2M 22 326
- Software 11.02 2M 22 332 (not available for US versions)
- Software 20.04 2M 22 327
- Software 21.02 2M 22 331
- Software 1.01 2M 22 328

The necessary software versions are delivered with new Analog PCBs as of order no. - revision index: 82 00 770 – 15, 82 00 920 – 16 and 82 90 680 – 03.

9.4.4 CPU PCB

Important: Software versions 11.nn and 21.nn only function in conjunction with the following CPU PCBs:

- CPU Standard 2 PCB 83 05 141
- CPU Incubator PCB 82 90 571 ≥ 01

  Note: The PCB CPU Incubator 82 90 571 with the modification status "00" is being replaced by a modification status "≥ 01", see IDM no. 15 or TSB no. 12.

9.4.5 Skin Display PCB

The new skin display PCB 82 90 691 is required if the incubator features the Analog PCB 82 90 680 with SW 11.nn or 21.nn. The difference with respect to the old Display PCB 82 90 431 is a differently positioned LED for the additional key for readout of the second skin-temperature channel. This new skin display PCB 82 90 691 can be used on all units IC / SC / NC for skin temperature.

9.4.6 Keypad

9.4.6.1 For Incubator 8000 IC

Software version	For units	Keypad
20.nn (old)	without skin-temperature meas.	82 90 470 (as before)
20.nn (old)	with skin-temperature meas. (1 measurement channel)	Currently 2 possibilities: - 82 90 467 (discontinued type) - 2M 21 681 Important: use 2M 21 681 in units which used to have a different keypad: - Use strip supplied to deactivate key for second skin-temperature channel. - On display PCB (82 90 431) for skin, remove third LED from top, as there is no hole for this in the new keypad.
21.nn (new)	without skin-temperature meas.	82 90 470 (as before)
21.nn (new)	with skin-temperature meas., 1 measurement channel	2M 21 681 Important: Use strip supplied to deactivate key for second skin-temperature channel. Please order the sticker 2M 21 921 always in addition to the spare parts keypad or electronics module for US units with ThermoMonitoring.
21.nn (new)	with skin-temperature meas., 2 measurement channels (ThermoView)	2M 21 681 Important: Use strip supplied to activate key for second skin-temperature channel. Please order the sticker 2M 21 921 always in addition to the spare parts keypad or electronics module for US units with ThermoMonitoring.

4.6.2 For Incubator 8000 SC/NC

Software version	For units	Keypad
10.nn (old)	without skin-temperature meas.	For SC and NC with central alarm LED: - 2M 21 182 or only for SC (discontinued type) without central alarm LED labeled „Incubator 8000 SC“: - 82 90 419 Note: The central alarm LED is not served by SW 10.nn and is also not described in operating instructions.
10.nn (old)	with skin-temperature meas. (1 measurement channel)	Currently several possibilities: For SC and NC without central alarm LED: - 2M 21 180 (discontinued type) or only for SC (discontinued type) without central alarm LED labeled „Incubator 8000 SC“: - 82 90 415 In future for all SC and NC with central alarm LED: - 2M 21 691 Important for use of 2M 21 691 in units which used to have a different keypad: - Use strip supplied to deactivate key for second skin-temperature channel. - On display PCB (82 00 650 or 82 90 431) for skin, remove third LED from top, as there is no hole for this in the new keypad. Note: The central alarm LED is not served by SW 10.nn and is also not described in operating instructions.
11.nn (new)	without skin-temperature meas.	For SC and NC with central alarm LED: 2M 21 182
11.nn (new)	with skin-temperature meas., 1 measurement channel	2M 21 691 Important: Use strip supplied to deactivate key for second skin-temperature channel.

11.nn (new)	with skin-temperature meas., 2 measurement channels (Thermomonitoring)	2M 21 691 Important: Use strip supplied to activate key for second skin-temperature channel. Please order the sticker 2M 21 921 always in addition to the spare parts keypad or electronics module for US units with ThermoMonitoring.

9.4.7 Modules

Important: Modules are supplied without software (EPROM).

Important: The modules are always supplied without Controller PCB (RS232 interface with BabyLink). For RAT procedure, Controller PCB is always to be removed.

Important: The alarm LED (central alarm) is not served by SW 10.nn and is also not described in the operating instructions for these units. Such units may however feature this LED.

Unit / software	**New as of 7.95** New part (RAT part)	**To date** New part (RAT part)
Inc. 8000 IC, without skin, for SW 21.nn and 20.nn	82 90 444 (82 90 606)	82 90 444 (82 90 606)
Inc 8000 IC, with skin, for SW 20.nn	82 90 443 (82 90 605)	82 90 443 (82 90 605)
Inc 8000 IC, with skin, for SW 21.nn	2M 21 680 (2M 21 704)	Previously not available
Inc. 8000 SC, without skin, for SW 10.nn	2M 21 730 (2M 21 732), with alarm LED (central alarm)	82 90 442 (82 90 604) labeled "Incubator 8000 SC“, without alarm LED (central alarm)
Inc. 8000 SC, without skin, for SW 11.nn and 10.nn	2M 21 730 (2M 21 732), with alarm LED (central alarm)	Previously not available
Inc 8000 SC, with skin, for SW 10.00	2M 21 330 (2M 21 406), with alarm LED (central alarm)	82 90 441 (82 90 603) labeled "Incubator 8000 SC“, without alarm LED (central alarm)
Inc 8000 SC, with skin, for	2M 21 690 (2M 21 698), with alarm LED (central alarm)	Previously not available

SW 11.nn		
Inc. 8000 NC, without skin, for SW 10.nn	2M 21 730 (2M 21 732), with alarm LED (central alarm)	2M 21 320 (2M 21 405), without alarm LED (central alarm)
Inc. 8000 NC, without skin, for SW 11.nn and 10.nn	2M 21 730 (2M 21 732), with alarm LED (central alarm)	Previously not available
Inc 8000 NC, with skin, for SW 10.nn	2M 21 330 (2M 21 406), with alarm LED (central alarm)	2M 21 330 (2M 21 406), without alarm LED (central alarm)
Inc 8000 NC, with skin, for SW 11.nn	2M 21 690 (2M 21 698), with alarm LED (central alarm)	Previously not available

Important for new parts:
The old modules will become invalid once stocks have been sold up and will be replaced by the modules in the column "New as of 7.95“.

Important for RAT parts:
The old modules will become invalid once stocks have been sold up and will be replaced by the modules in the column "New as of 7.95“. RAT return items in line with old status will be converted to current status and given a new order number. This procedure represents an exception, as normally only RAT parts assigned a new parts number are accepted. This procedure is designed to reduce stocks of modules.

9.4.8 Climate Sensor (Inc. 8000 IC only)

Software version	For units	Climate sensor
20.nn (old)	without skin-temperature meas.	- 82 90 380, old - 2M 21 688, new - this sensor has no skin-temperature connection
20.nn (old)	with skin-temperature meas.	82 90 380, old The skin-temperature sensor connection requires an adapter for this climate sensor.
21.nn (new)	without skin-temperature meas.	Currently 2 possibilities - 2M 21 688, new - In emergencies the old climate sensor 82 90 380 can also be used for units without skin-temperature measurement.
21.nn (new)	with skin-temperature meas.	- 2M 21 688, new This sensor has no skin temperature connection.

Features:

82 90 380 = Climate sensor for 2 O2 sensors and connection for skin-temperature sensor. Such a sensor is required for units with SW 20.nn (or 0.4 or 1.0) with skin temperature.

2M 21 688 = Climate sensor for without connection for skin-temperature sensor, otherwise identical with 82 90 380. This sensor cannot be used for units with SW 20.nn (or 0.4 / 1.0) with skin temperature.

9.5 New Error Messages

As of SW 11.nn and 21.nn the following new error numbers are featured in addition to the familiar error messages (see Section 6):

Error no.	Results in	When set	Description, cause and remedy
88	Sensor error Skin	Opera-tion	**Short circuit, 2nd skin-temperature sensor** Error recognition Voltage of second channel of skin-temperature amplifier too high. Cause of trouble: - Skin-temperature sensor defective - Analog PCB 82 90 680 defective - Wiring harness between Analog PCB and connection of skin-temperature sensor defective Remedy: - Renew skin-temperature sensor - Renew Analog PCB 82 90 680
89	Sensor error Skin	Opera-tion	**Cable break, 2nd skin-temperature sensor** Error recognition: Voltage of second channel of skin-temperature amplifier too low. Cause of trouble: - Skin-temperature sensor defective - Analog PCB 82 90 680 defective - Wiring harness between Analog PCB and connection of skin-temperature sensor defective Remedy: - Renew skin-temperature sensor - Renew Analog PCB 82 90 680
90	Err-Skin	Opera-tion	“Foot temperature" key in skin module sticking Error recognition, possible errors and remedy: See error 68

91	INOP	Opera-tion	**CPU watchdog defective** Error recognition: Watchdog on CPU PCB not functioning or not fitted. Cause of trouble: - CPU PCB defective - Invalid CPU PCB 82 90 571 - 00 without watchdogs fitted. The modification index for this CPU PCB 82 90 571 must be greater than “00“, e.g. “01.0“.
92	Err-Skin	Opera-tion	**Switching between skin-temperature sensor 1 and 2 defective** Cause of trouble: Analog PCB 82 90 680 defective
93	INOP	Start	**CPU watchdog defective** See error 91

9.6 Test Equipment

The new incubators with the side skin-temperature sensor connections feature a new connector.

For the skin sensor simulator 79 01 236 two adapters are available:

Adapter for yellow connector	79 10 463
Adapter for white connector	79 10 464

The simulator and the two adapter are also available in the kit 79 10 499.

The previous test equipment can still be used for calibrating the skin-temperature amplifier on the Analog PCB.